DOCUMENT RESUME

ED 342 455 JC 920 139

AUTHOR Kangas, Jon; Budros, Kathleen
TITLE Competency and Persistence of New College Students Enrolled in Math 310 at San Jose City College, Fall 1990. Research Report #127.
INSTITUTION San Jose City Coll., Calif.
SPONS AGENCY San Jose/Evergreen Community Coll. District, San Jose, CA.
PUB DATE Feb 92
NOTE 25p.
PUB TYPE Reports - Research/Technical (143) -- Statistical Data (110)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Academic Persistence; Community Colleges; *Educational Assessment; *Mathematical Enrichment; Mathematics Instruction; Mathematics Skills; Minimum Competencies; Minimum Competency Testing; Remedial Mathematics; Two Year Colleges

ABSTRACT

A study was conducted at San Jose City College (SJCC) to identify and track 163 new students enrolled in Math 310 over a period of several semesters. Data on the students' competency and persistence rates were collected for fall 1990 and spring 1991, along with subsequent math class enrollments and success rates. Study findings included the following: (1) 44% of the 163 students enrolled in Math 310 in fall 1990 achieved competency their first semester, and another 8 students achieved competency during the next semester; (2) only 72 (44%) of the Math 310 students persisted to the second semester; (3) no ethnic group achieved above a 50% competency rate or a 50% persistence rate; (4) White females and Black males had 50% or higher competency rates, while the competency rates for Asian females and Black females were below 35%; (5) Asian males (60%) and Black males (57%) had the highest persistence rates, while Asian females (33%), Hispanic males (33%), and Black females (18%) had the lowest; (6) the younger the student, the more likely he/she was to reach first-semester competence; (7) 62% of the students under 20 years of age persisted to the second semester, compared to 27% of the students over 35; (8) students in classroom settings reached competency at a much higher rate (64%) than those in structured labs (46%), though structured lab students persisted at a higher rate (55%) than classroom students (31%). Data tables, charts, and recommendations are included. (JSP)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED342455

Competency and Persistence of New College Students Enrolled in Math 310 at San Jose City College Fall 1990

Research Project #127

By:
Jon Kangas and Kathleen Budros

A Title III Grant Project
San Jose/Evergreen Community College District

JC 920 139

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

J. Kangas

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☒ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

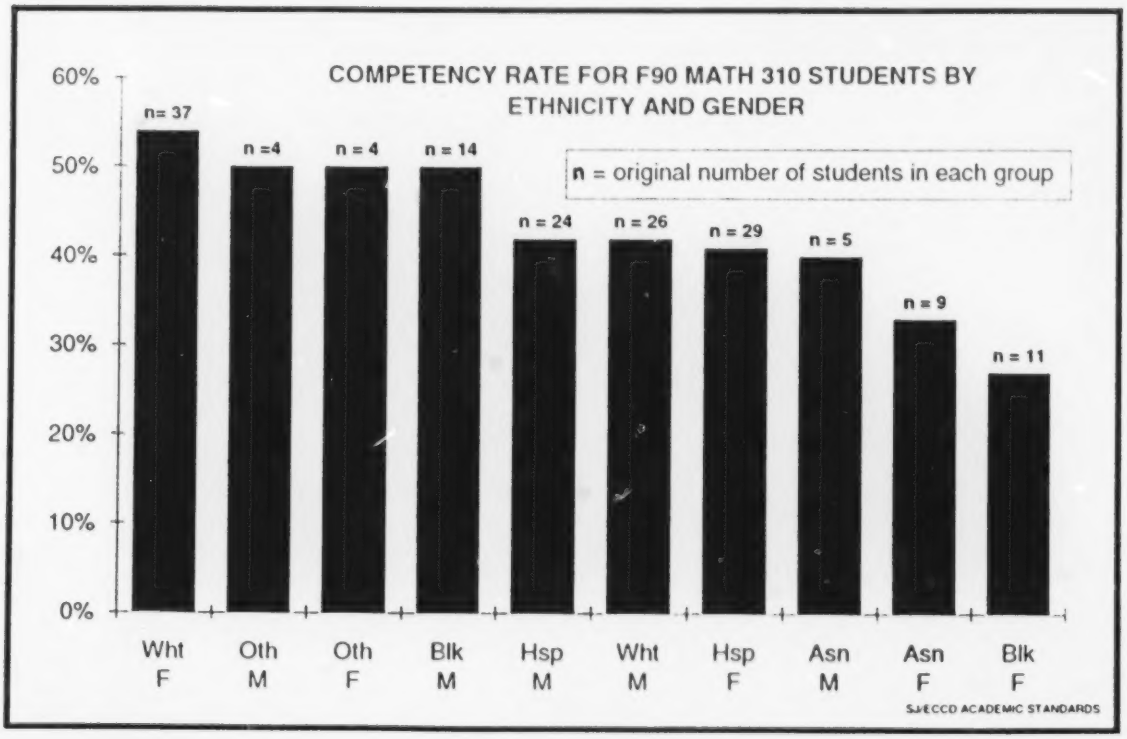
BEST COPY AVAILABLE

COMPETENCY AND PERSISTENCE OF NEW COLLEGE STUDENTS ENROLLED IN MATH 310 AT SAN JOSE CITY COLLEGE FALL 1990

(Potential Format for Displaying Competency and Persistence Data)

by
Jon Kangas and Kathleen Budros

-- A TITLE III GRANT PROJECT --
San Jose/Evergreen Community College District



BACKGROUND & ACKNOWLEDGEMENTS

This project is being funded by the San Jose/Evergreen Community College District's Title III Grant. Potential formats for displaying competency and persistence data in the Developmental Studies area are being developed, examples of which appear in this report. The goal is to develop, pilot test, and refine templates so that profiles of success, retention, and persistence rates become standard data and will not require clerical support after the term of the grant. The assumption is that through the development of data collection and the evaluation of intervention models resulting, in part, from these data, the rates of success, retention, and persistence of Developmental Studies students at SJCC will increase.

The object of this particular study is to identify and track 163 New College Students enrolled in Math 310 at San Jose City College Fall 1990, over a period of several semesters. Their competency and persistence rates for Fall 1990 and Spring 1991, along with subsequent math class enrollments and success are documented in this report.

Grant Author

Dr. Greg Ohanneson

Project Report

Dr. Jon Kangas

Data Collection & Document Preparation

Kathleen Budros, Research Assistant

DATA HIGHLIGHTS

- COMPETENCY & PERSISTENCE: TOTAL GROUP

  - 44% of 163 new college students who were enrolled in Math 310 at SJCC for Fall 1990 achieved competency the first semester. An additional eight students reached competency during the next semester, making the cumulative two-term competency rate 49%.
  - Only 72 (44%) of these Math 310 students persisted to the second semester.

- COMPETENCY & PERSISTENCE: BY ETHNICITY

  - No ethnic group achieved above a 50% competency rate. Others (50%) and Whites (49%) had the highest competency rates. Blacks (40%) and Asians (36%) had the lowest.
  - No ethnic group achieved above a 50% persistence rate. Others (50%) and Whites (49%) had the highest persistence rates. Blacks (40%) and Hispanics (40%) had the lowest.

- COMPETENCY & PERSISTENCE: BY ETHNICITY AND GENDER

  - White Females, Other Males and Females, and Black Males all had 50% or higher competency rates, while Asian Females (33%) and Black Females (27%) had rates below 35%.
  - Asian Males (60%) and Black Males (57%) had the highest persistence rates, while Asian Females (33%), Hispanic Males (33%), and Black Females (18%) had the lowest.

- COMPETENCY & PERSISTENCE: MALE/FEMALE WITHIN ETHNIC GROUPS

  - Black Males, with a 50% first semester competency rate, tied with Other Male and Other Female for the highest rate, while Black Females had the lowest competency rate at only 27%. White Females were the only females to rank higher than their male counterparts (54% to 42%).
  - Asian Males had the highest persistence rate (60%), while Asian Females had one of the lowest (33%). Black Males had one of the highest persistence rates (57%), while Black Females had the lowest (18%). Hispanic Females persisted at a rate considerably higher than Hispanic Males, the only group with higher female persistence.

- COMPETENCY & PERSISTENCE: BY AGE

  - The younger the student, the more likely he/she was to reach first semester competence (>20 = 56%; 35+ = 33%).
  - The youngest students (>20) persisted most (62%), oldest students (35+) least (27%). A large group (39 students) in the 20-24 age bracket is of concern at only 31% persistence.

- COMPETENCY & PERSISTENCE: BY METHOD OF INSTRUCTION

  - Students in the classroom setting reached competency at a much higher rate (64%) than those in the Structured Lab (46%) or the LSC (28%).
  - Students in the Structured Lab persisted at the highest rate (55%) compared to those in the LSC (38%) and the classroom (31%).

PROFILE OF NEW SJCC F90 MATH 310 STUDENTS

AGE		NUMBER	PERCENT
	<20	50	31%
	20-24	39	24%
	25-29	38	23%
	30-34	20	12%
	35+	15	9%
	TOTAL	162	100%

ETHNICITY		NUMBER	PERCENT
	ASN	14	9%
	BLK	25	15%
	HSP	53	33%
	WHT	63	39%
	OTH	8	5%
	TOTAL	163	100%

GENDER		NUMBER	PERCENT
	M	73	45%
	F	90	55%
	TOTAL	163	100%

# UNITS ATTEMPTED	1 UNIT	2 UNITS	3 UNITS	TOTAL STUDENTS	
	49 (30%)	28 (17%)	86 (53%)	163	100%

# UNITS COMPLETED	1 UNIT	2 UNITS	3 UNITS	TOTAL STUDENTS	
	43 (33%)	28 (22%)	59 (45%)	130	80%

SUCCESS	CR	I	NC	W
	130 (80%)	7 (4%)	24 (15%)	2 (1%)

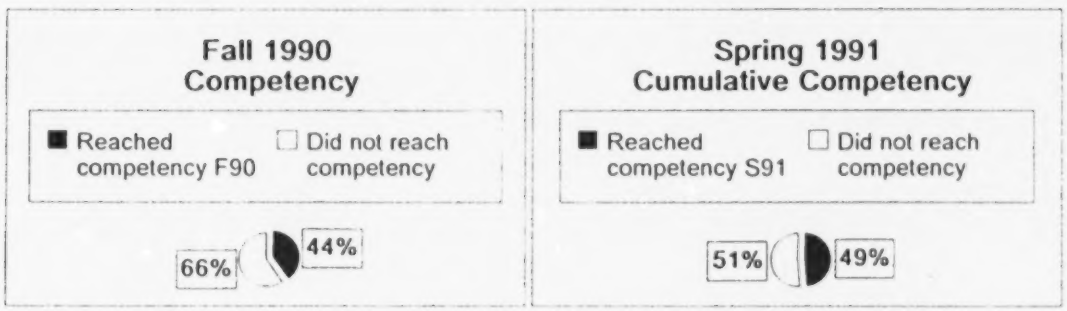
I. COMPETENCY

A. Number and percent.

QUESTION: How many students reached Math 310 competency during Semester 1 and Semester 2?

	Number	Percent
Reached competency F90	72	44%
Did not reach competency	91	66%
Total	163	100%

	Number	Cum. number	Cum. percent
Reached competency S91	8	80	49%
Did not reach competency		83	51%
Total		163	100%



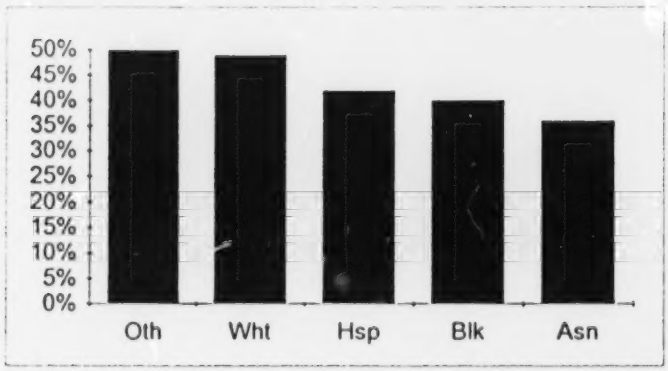
ANSWER: **72 of 163 (44%) achieved competency the first semester. Eight more reached competency during the second semester, making the cumulative two-semester competency rate 49%.**

Key: Competency = Math Level 1 allowing students to progress to beginning algebra.

B. Competency. Number and percent by ethnicity.

QUESTION: Did the number and percent reaching competency vary by ethnicity?

	Number	Percent
Oth	4 of 8	50%
Wht	31 of 63	49%
Hsp	22 of 53	42%
Blk	10 of 25	40%
Asn	5 of 14	36%

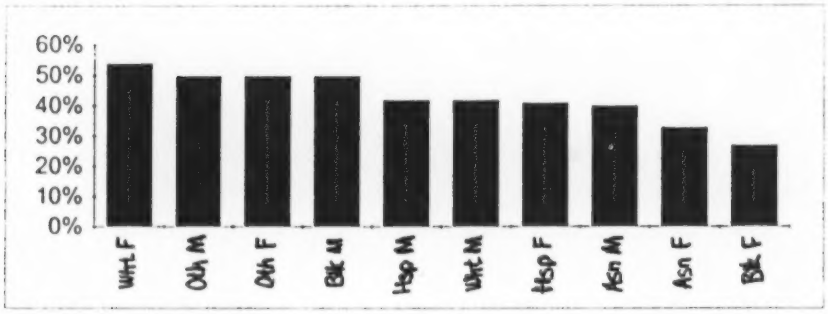


ANSWER: Yes. No group was high, relatively speaking. Whites (49%) and Others(50%) had the highest competency rates; Blacks (40%) and Asians (36%) had the lowest.

C. Competency . Number and percent by ethnicity and gender.

QUESTION: Did the number and percent reaching competency vary by ethnicity and gender?

	Number	Percent
Wht F	20 of 37	54%
Oth M	2 of 4	50%
Oth F	2 of 4	50%
Blk M	7 of 14	50%
Hsp M	10 of 24	42%
Wht M	11 of 26	42%
Hsp F	12 of 29	41%
Asn M	2 of 5	40%
Asn F	3 of 9	33%
Blk F	3 of 11	27%



GENDER ONLY:

# Males in original group	# Males F90 competency	% comp Males
73	32	44%

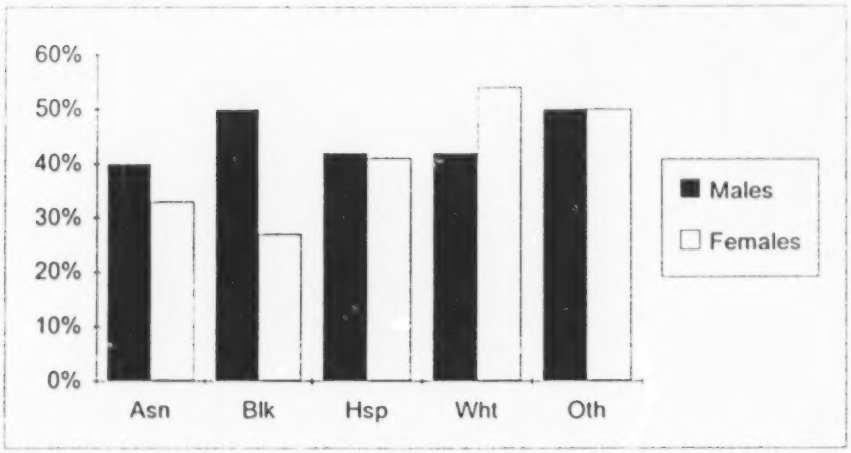
# Females in original group	# Females F90 competency	% comp Females
90	40	44%

ANSWER: Yes. White Females, Other Males and Females, and Black Males all had 50% or higher competency rates, while Asian Females (33%) and Black Females (27%) had below 35% competency rates.

D. Competency. Male/female Math 310 competency within ethnic groups.

QUESTION: Within each ethnic group, were there differences between males and females in reaching Math 310 competency?

	Total Number	F90 Competency Males	F90 Competency Females	% Points Difference
Asn	14	40%	33%	7
Blk	25	50%	27%	23
Hsp	53	42%	41%	1
Wht	63	42%	54%	12
Oth	8	50%	50%	0
Total	163	44%	44%	0



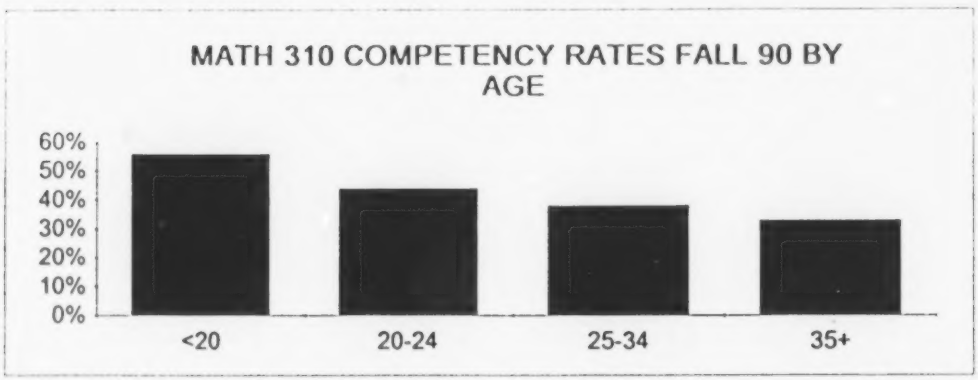
ANSWER: Yes. Black Males (50%) did very well compared to Black Females (27%). Asian Males (40%) were seven percentage points higher than Asian Females (33%). The competency rate for White Females (54%) was substantially higher than White Males (42%); however, by the end of the second semester, the cumulative competency rate for White Males had increased to 54% compared to 57% for White Females.

E. Competency. Number and percent by age .

QUESTION: Within age groups were there differences in competency rates?

	Fall 1990	
Age	#	%
<20	28 of 50	56%
20-24	17 of 39	44%
25-34	22 of 58	38%
35+	5 of 15	33%
*Total	72 of 162	44%

*One student was omitted because his age was unknown.

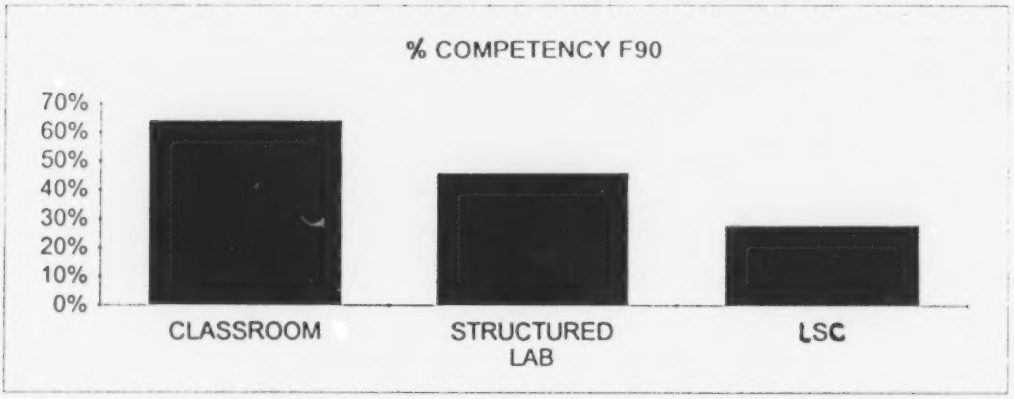


ANSWER: Definitely yes. The younger the student (<20 = 56%), the more likely he/she was to reach competency.

F. Competency. Number and percent by method of instruction.

QUESTION: Did method of instruction relate to the number and percent reaching competency?

	#	#COMPETENCY F90	%COMPETENCY F 90
CLASSROOM	36	23	64%
STRUCTURED LAB	74	34	46%
LSC	53	15	28%
TOTAL	163	72	44%



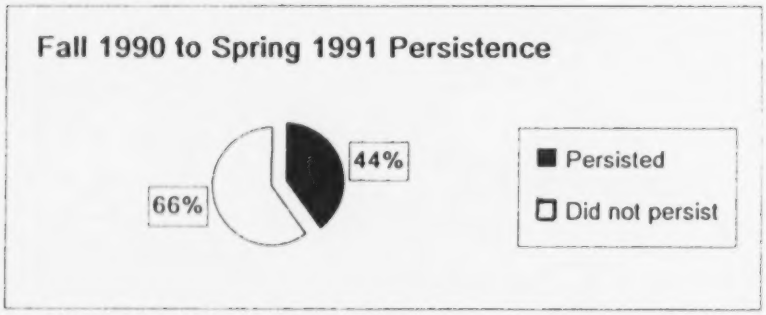
ANSWER: Yes. Students in the classroom setting reached competency at a much higher rate (64%) than those in the Structured Lab (46%) or the Learning Skills Center (LSC) (28%). A separate report deals with this issue in more depth: *Research Report #126, SUCCESS, COMPETENCY AND PERSISTENCE OF COLLEGE STUDENTS IN MATH 310 AT SJCC BY METHOD OF INTSTRUCTION FALL 1990.*

II. PERSISTENCE

A. Number and percent.

QUESTION: What number and percentage of Math 310 (new college) students persisted from Fall 1990 to Spring 1991?

	Number	Percent
Persisted	72	44%
Did not persist	91	66%
Total	163	100%



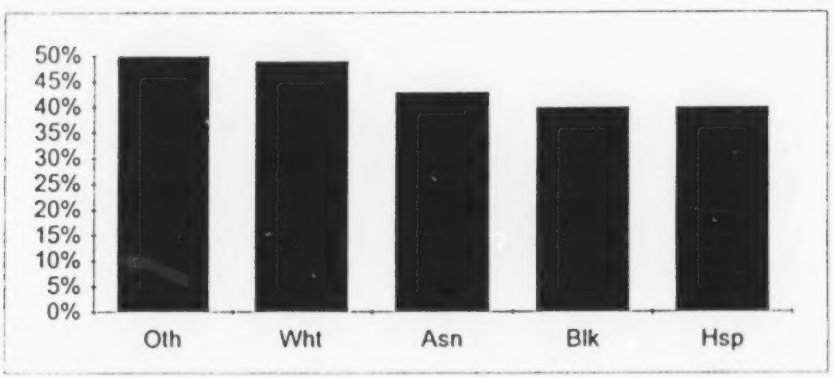
ANSWER: Only 72 (44%) of these Math 310 students persisted.

Key: Persistence = enrolling and succeeding in at least 1/2 unit the subsequent semester.

B. Persistence. Number and percent by ethnicity.

QUESTION: What was the number and percentage of persistence by ethnicity?

	Number	Percent
Oth	4 of 8	50%
Wht	31 of 63	49%
Asn	6 of 14	43%
Blk	10 of 25	40%
Hsp	21 of 53	40%

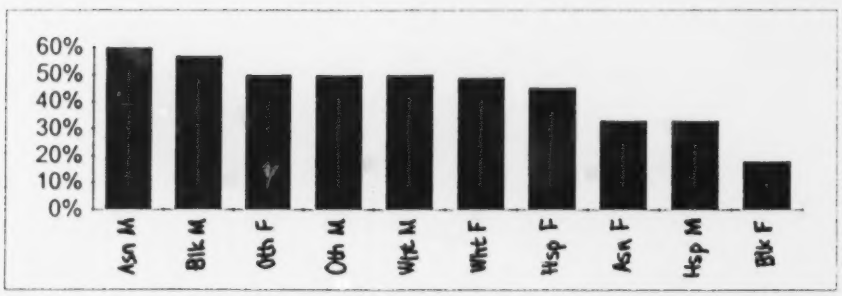


ANSWER: No group had high persistence. Relatively speaking , however, Other (50%) and White (49%) had the highest persistence. Black (40%) and Hispanic (40%) had the lowest.

C. Persistence. Number and percent by ethnicity and gender.

QUESTION: Did persistence vary by ethnicity and gender?

	Number	Percent
Asn M	3 of 5	60%
Blk M	8 of 14	57%
Oth F	2 of 4	50%
Oth M	2 of 4	50%
Wht M	13 of 26	50%
Wht F	18 of 37	49%
Hsp F	13 of 29	45%
Asn F	3 of 9	33%
Hsp M	8 of 24	33%
Blk F	2 of 11	18%



GENDER ONLY:

# Males in original group	# Males persisting S91	% persisting
73	34	47%

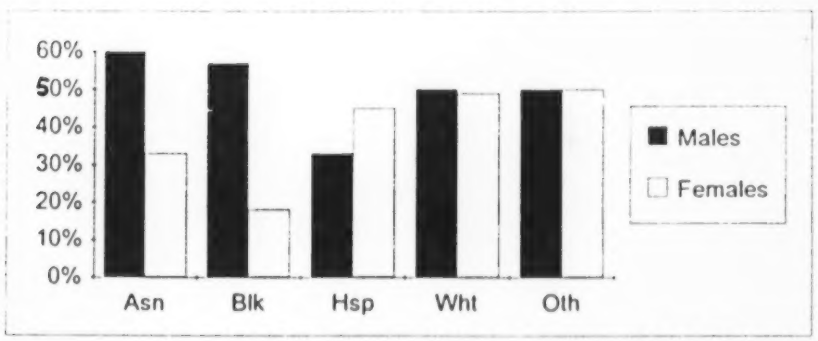
# Females in original group	# Females persisting S91	%persisting
90	38	42%

ANSWER: Asian Males (60%) and Black Males (57%) had the greatest persistence, while Asian Females (33%) , Hispanic Males (33%), and Black Females (18%) had the lowest.

D. Persistence. Male/female persistence within ethnic groups.

QUESTION: Within each ethnic group, were there differences between males and females in persistence?

	Total	S91 persistence		
	Number	Males	Females	Difference
Asn	14	60%	33%	27
Blk	25	57%	18%	39
Hsp	53	33%	45%	12
Wht	63	50%	49%	1
Oth	8	50%	50%	0
Total	163	47%	42%	5



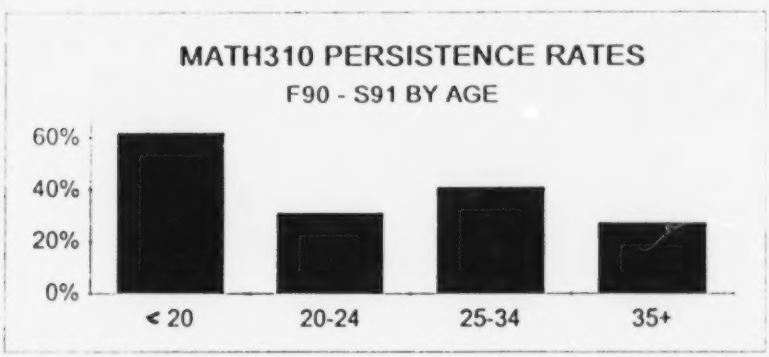
ANSWER: Black Males had one of the highest persistence rates (57%) while Black Females had the lowest (18%). Asian Males had the highest persistence rate (60%), while Asian Females had one of the lowest (33%). Hispanic Females persisted at a rate considerably higher than Hispanic Males; this was the only ethnic group with higher female persistence.

E. Persistence. Number and percent by age.

QUESTION: Within age groups were there differences in persistence rates?

Age	to Spring 1991 #	%
< 20	31 of 50	62%
20-24	12 of 39	31%
25-34	24 of 58	41%
35+	4 of 15	27%
*Total	71 of 162	44%

*One student was omitted because his age was unknown.

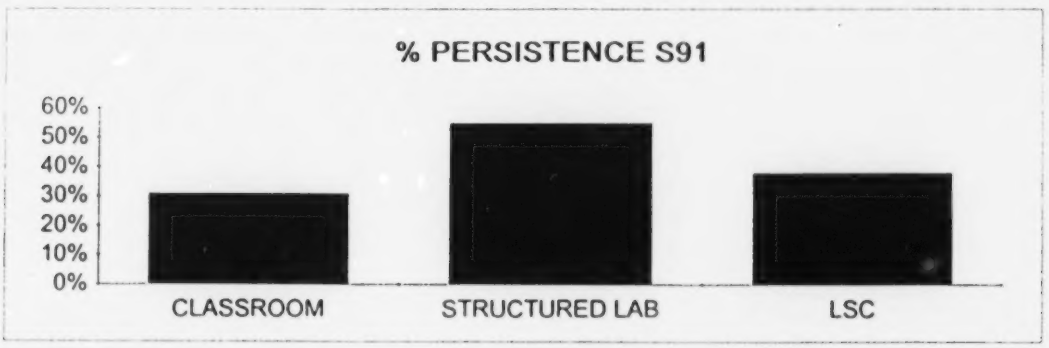


ANSWER: The post high school age group (<20) persisted most at 62% followed by the 25-34 age group at 41%. The 20-24 age group, with many students, is of concern at only 31% persistence.

F. Persistence. Number and percent by method of instruction.

QUESTION: Did the method of instruction relate to the number and percent persisting to Spring 1991?

	#	#PERSISTING S91	% PERSISTING S 91
CLASSROOM	36	11	31%
STRUCTURED LAB	74	41	55%
LSC	53	20	38%
TOTAL	163	72	44%



ANSWER: Yes. Students in the Structured Math Lab persisted at a 55% rate while those in the Learning Skills Center (LSC) persisted at 38%, and only 31% of the Classroom students persisted. A separate report deals with this issue in more depth:
Research Report #126, SUCCESS, COMPETENCY AND PERSISTENCE IN MATH 310 AT SJCC BY METHOD OF INSTRUCTION FALL 1990.

III. SUCCESSFUL COMPLETION OF HIGHER LEVEL MATH BY MATH 310 STUDENTS.

Completion of Math 11A/11R (elementary algebra) is needed for an AS degree.
Completion of Math 13 is necessary to take transfer level math.
Completion of Math 21 or 22 meets the AA GE and CSU GE math requirement.

If Math 310 students don't complete Math 11A /11R or Math 21/22, they will not receive a degree or transfer.

QUESTION:

Do Math 310 students proceed to complete other math courses that relate to the AS degree (11A/11R prepares students for college level math, Math 13) or courses that meet AA or CSU GE requirements?

***SJCC DEVELOPMENTAL STUDIES TRACKING SYSTEM
NEW COLLEGE STUDENTS IN MATH 310 FALL 1990

Entering Cohort= 163	Fall 1990	Sp 1991	Su 1991	All Terms
Math 310 (Arithmetic) Enrollment	163	18	2	183
Math 310 (Arithmetic) Competency	72	8	1	81
Math 311 (Pre-Algebra) Enrollment		2	0	2
Math 311 (Pre-Algebra) Competency		0	0	0
Math 11A, 11R, &12 (Algebra) Enrollment		30	1	31
Math 11A, 11R, & 12 (Algebra) Competency		12	1	13
Math 13 (Intermediate Algebra) Enrollment			1	1
Math 13 (Intermediate Algebra) Competency			1	1
Transfer Enrollment				
Transfer Competency				
Total enrolled in Math	163	50	4	
Not enrolled in Math		28	12	
Total continuing enrollment		78	16	
CUMULATIVE COMPETENCY				
Math 310 Competency	72	80	81	
Math 311 Competency		0	0	
Math 11A, 11R, & 12 Competency		12	13	
Math 13 Competency		0	1	
Transfer Math Competency		0	0	
CUMULATIVE PERCENT COMPETENCY				
Math 310 Competency	44%	49%	**50%**	
Math 311 Competency		0%	**0%**	
Math 11A, 11R, & 12 Competency		7%	**8%**	
Math 13 Competency		0%	**1%**	
Transfer Math Competency		0%	**0%**	

ANSWER:

It doesn't look promising. Two terms after the initial Math 310 class, only 8% had successfully completed Math 12 and 1% had successfully completed Math 13. Data will be gathered for several more semesters.

DISCUSSION AND RECOMMENDATIONS

The following recommendations are presented for reflection and discussion:

The possibility should be considered that, in general, the majority of Math 310 students will not graduate or transfer. If this proves to be true, we have two problems to address:

1. We need to avoid lowering the expectations for those who can proceed in college to get a degree or transfer.

2. We need to provide a realistic, in-depth,and professional assessment of skills and optional job and career paths for those students who are unlikely to complete a degree or transfer.

Ideally, the Math 310 semester should be conceived of as an in-depth assessment semester. A staff of professionals should bring their expertise to this assessment semester. This panel should include professional counselors, a job placement specialist, learning disability and assessment specialist, a social worker, and instructors. An assessment should be made for learning disabilities, aptitudes, interests, personal support systems, and resources. A thorough educational/job/career plan should be prepared for and with each individual student. The panel of professionals needs a thorough knowledge of courses providing instruction in employable skills and of community resources and support for persons who do not have AS or AA degree level skills.

A fundamental premise for this approach is that it would be far more responsible for the college to provide positive and successful educational, job, and career opportunities for students than to continually fail students as a way of communicating that a college path is not for them. Typically, students who leave college with failure experiences have not advanced in skills and self-esteem or developed a positive, clear sense of direction. Again, the error to guard against is lowering the sights and expectations of the students who can, with well-conceived help, get a degree or a transfer.

Special attention needs to be focused on the needs of those groups who enter Math 310 and reach competency at the lowest rate. Asian Females (33% competency) and Black Females (27% competency) may need intervention and support programs tailored to meet their needs.

Ongoing monitoring of the success, competency, and persistence rates of Math 310 students is essential to evaluate the effectiveness of programs, methodologies, and intervention strategies on this group.

COMPETENCE AND PERSISTENCE OF NEW COLLEGE STUDENTS
MATH 310 SJCC FALL 1990

ETHNIC GRP	TOTAL #F90	TOTAL %F90	COMP #F90	COMP %F90	PERS #S91	PERS %S91
ASN M	5	36%	2	40%	3	60%
ASN F	9	64%	3	33%	3	33%
ASN TOT	14	9%	5	36%	6	43%
BLK M	14	56%	7	50%	8	57%
BLK F	11	44%	3	27%	2	18%
BLK TOT	25	15%	10	40%	10	40%
HSP M	24	45%	10	42%	8	33%
HSP F	29	55%	12	41%	13	45%
HSP TOT	53	33%	22	42%	21	40%
WHT M	26	41%	11	42%	13	50%
WHT F	37	59%	20	54%	18	49%
WHT TOT	63	39%	31	49%	31	49%
OTH M	4	50%	2	50%	2	50%
OTH F	4	50%	2	50%	2	50%
OTH TOT	8	5%	4	50%	4	50%
TOT M	73	45%	32	44%	34	47%
TOT F	90	55%	40	44%	38	42%
M310 TOT	163	100%	72	44%	72	44%
M310 M	73	45%	32	44%	34	47%
M310 F	90	55%	40	44%	38	42%
M310 TOTAL	163	100%	72	44%	72	44%

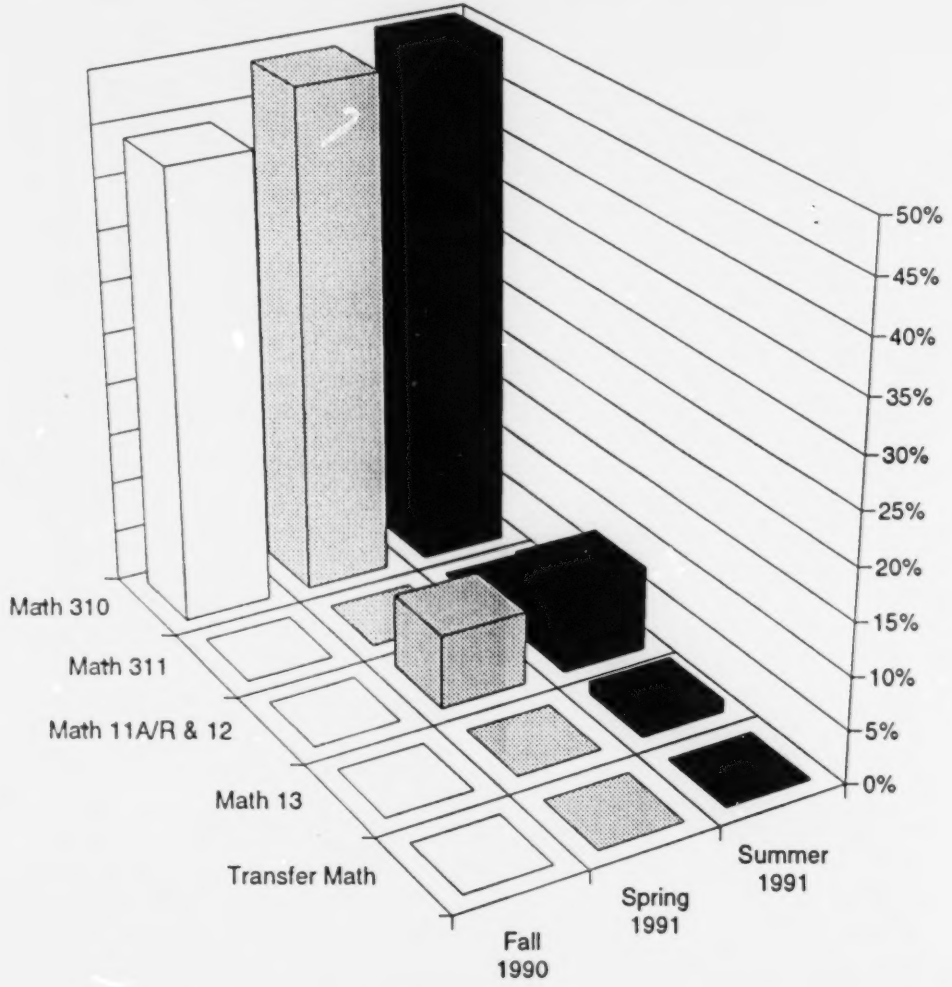
KEY:
Competence = Math Level 1 which allows students to progress to beginning algebra.
Persistence = enrolling and succeeding in at least 1/2 unit the subsequent semester.

KB.1M310XE&G.XLS2/12/92

17 BEST COPY AVAILABLE

MATH LEVEL 1, FALL 1990 COHORT--COURSE SEQUENCE COMPLETION

Subsequent math competency for 163 Math 310 students who began in Fall 1990. Example: Of 163 Math 310 Fall 1990 students, 8% completed Math 12 through Summer 1991.



KB.3MGRAPH1.XLS Chart 5 2/25/92

Comment: Less than 50% of 163 Math 310 students reached competency by the end of 3 terms. Only 8% of the original group successfully completed Math 12 during that time.

SJCC DEVELOPMENTAL STUDIES TRACKING SYSTEM

NEW College Students in Math 310 Fall 1990

Entering Cohort = 163	Fall 1990	Spring 1991	Summer 1991	All Terms*
# Enrolled & # Reaching Competency Each Term				
Math 310 (Arithmetic) Enrollment	163	18	2	183
Math 310 (Arithmetic) Competency	72	8	1	81
Math 311 (Pre-Algebra) Enrollment		2	0	2
Math 311 (Pre-Algebra) Competency		0	0	0
Math 11A, 11R, &12 (Algebra) Enrollment		30	1	31
Math 11A, 11R, & 12 (Algebra) Competency		12	1	13
Math 13 (Intermediate Algebra) Enrollment			1	1
Math 13 (Intermediate Algebra) Competency			1	1
Transfer Enrollment				
Transfer Competency				
Total enrolled in Math	163	50	4	
Total persisting, but not enrolled in Math		23	12	
Total persisting enrollment		73	16	
CUMULATIVE COMPETENCY (#)				
Math 310 Competency	72	80	81	
Math 311 Competency		0	0	
Math 11A, 11R, & 12 Competency		12	13	
Math 13 Competency		0	1	
Transfer Math Competency		0	0	
CUMULATIVE COMPETENCY (%)				
Math 310 Competency	44%	49%	50%	
Math 311 Competency		0%	0%	
Math 11A, 11R, & 12 Competency		7%	8%	
Math 13 Competency		0%	1%	
Transfer Math Competency		0%	0%	

* All terms: Number of enrollments includes students repeating a class to acquire more units or a better grade.

Cumulative competency is computed by dividing the cumulative number of students reaching competency each term by the total original number of students (163).

ERIC Clearinghouse for Junior Colleges
APR 24 1992

KB3.MSUMMARY.XLS 2/11/92

BEST COPY AVAILABLE